

FEASIBILITY STUDY

**Improvements to US 23/US 441 (Georgia Road)
from SR 1649 (Prentiss Bridge Road)
to US 64 Interchange
Macon County**

Division 14

FS-1214A



**Prepared by the
Program Development Branch
N. C. Department of Transportation**

DocuSigned by:

Sonya A. Tankersley

ESC100C893CA414

**Sonya Avant Tankersley, P.E.
Feasibility Studies Engineer**

DocuSigned by:

Derrick Lewis

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**Derrick W. Lewis, P.E.
Feasibility Studies Unit Head**

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Date

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I. General Description

This feasibility study describes the improvements of US 23 / US 441 (Georgia Road) from SR 1649 (Prentiss Bridge Road) to US 64 Interchange in Macon County, North Carolina. The length of the project corridor is 3.5 miles. Portions of the project area is located in the Town of Franklin Town Limits (urban), ETJ (urban) and Macon County (rural).

The town limits reach to SR 1652 (Wide Horizon Drive) and SR 1152 (Belden Circle). There is a portion of the town located adjacent to Ruby Cinemas south of SR 1150 (Jones Ridge Road). The municipal limits include the Crystal Falls Specialty Shops just south of SR 1682 (Terrell Road). The Macon County Recreation Park on east side of US 23/441 of the first entrance to Blossomtown Drive is in the ETJ. The remainder of the project is located in the county. There are a lot of commercial properties located along the corridor. There are some residential homes on US 23/441 but mainly off the y-lines connected to US 23/441. The project location is shown on Figure 1.

The existing geometry of the road from SR 1687 (Allman Drive) north to the US 64 interchange is a four-lane divided facility with drop or channelized right turn lanes and dedicated left turn lanes. The existing geometry of US 23/441 south of SR 1687 (Allman Drive) is a five-lane facility. The current posted speed on the project is 45 mph inside town limits and 50 mph outside town limits. The recommended geometry is described below.

- ❖ Upgrade the five-lane facility to a four-lane divided, variable width narrow raised median curb and gutter facility. Access will be restricted to right in right out access with approximately 13 U-turn bulbs and 7 directional cross-overs.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

Once a candidate project is identified for funding in the TIP, the Feasibility Study is followed by a rigorous planning and design process that meets the requirements of

the National Environmental Policy Act (NEPA), where either an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) is done.

II. Background

The purpose of this project is to improve the traffic safety and operations along US 23 / US 441 (Georgia Road) from SR 1649 (Prentiss Bridge Road) to US 64 Interchange in Macon County, North Carolina.

US 23 / US 441 (Georgia Road) is designated as a Other Principal Arterial according to NCDOT Functional Classification. Other principal arterials collect minor arterials and connect them to freeways. US 23/ US 441 provides service to urban, residential, and business streets access to interstate, US, and NC routes and provides connectivity to Georgia.

There is one State Transportation Improvement Program (STIP) project within the proposed study area of FS-1214A.

- R-5734: This Feasibility Study will overlap with an R-5734 which is also an access management project from SR 1652 (Wide Horizon Drive) and SR 1152 (Belden Circle) to south of the US 64 interchange. The overlap is 0.7 mile long.

There is one bridge in the project study area. Please see Table 3 for detailed bridge information.

III. Traffic and Safety

Currently there are three existing traffic signals located along the project corridor. The signals are located at Franklin Plaza / US 23 Eastbound ramps, SR 1660 Siler Road and SR 1649 (Prentiss Bridge Road).

The existing 2013 Average Daily Traffic (ADT) along US 23/ US 441 (Georgia Road) is 23,900 vpd. For the design year 2040, the traffic volume is expected to be 34,200. Truck traffic on US 23 / US 441 (Georgia Road) is estimated to make up approximately 4 percent of the daily traffic.

The following table displays the level of service results for the signalized intersections.

Table 1: Level of Service

Alternate	LOS AM / PM Peak Hour		
	SR 1122 (Addington Bridge Road) / SR 1649 (Prentiss Bridge Road)	Entrance to Shopping Center / Siler Road	Franklin Plaza / US 64 EB On- ramp
2013	C/C	C/C	E/E
2040 (No Build)	C/D	D/C	F/F

Table 2: 2040 Build Level of Service

Alternate	LOS Peak Hour		
	SR 1122 (Addington Bridge Road) / SR 1649 (Prentiss Bridge Road) / U-Turn Bulb	Entrance to Shopping Center / Siler Road	Franklin Plaza / US 64 EB On- ramp
2040 AM Build	A(NB) / C(SB) / B(Dual U-Turn Bulb	D	D
2040 PM Build	B(NB) / C(SB) / B(Dual U-Turn Bulb	C	D

To gather all information pertaining to the study area, two strip analyses were requested for this project. The first strip analysis covered US 23/US 441(Georgia Road) from SR 1649 (Prentiss Bridge Road) to SR 1152 (Belden Circle) / SR 1652 (Wide Horizon Boulevard). Between 2010 and 2014, 99 total accidents were reported along the southern corridor. The total crash rate for this section of US 23/US 441 (Georgia Road) is 127.29 crashes per 100 million vehicle miles (crashes/100 MVM) traveled and the statewide crash rate is 108.68 crashes/100MVM for urban US Routes. There were 2 fatal crashes, 40 non-fatal injury crashes, and 57 property damage only crashes. The most prevalent types of crashes were Rear End, Slow or Stop Angle (23.23%), Fixed Object (14.14%), Sideswipe – Same Direction (12.12%), Angle (12.12%), and Left Turn – Different Roadways (10.00%). The severity index for crashes on the corridor is 9.67. The average severity index for an urban facility is 4.81.

The second strip analysis covered US 23/US 441(Georgia Road) from SR 1152 (Belden Circle) / SR 1652 (Wide Horizon Boulevard) to US 64 (Murphy Road-Sylva Road). Between 2010 and 2014, 170 total accidents were reported along the northern

corridor. The total crash rate for this section of US 23/US 441 (Georgia Road) is 491.24 crashes per 100 million vehicle miles (crashes/100 MVM) traveled and the statewide crash rate of 108.68 crashes/100MVM for urban US Routes. There were 4 fatal crashes, 52 non-fatal injury crashes, and 114 property damage only crashes. The most prevalent types of crashes were Rear End, Slow or Stop Angle (34.71%), Angle (18.24%), Left Turn, Same Roadway (11.18%), Sideswipe – Same Direction (10.00%), and Left Turn – Different Roadways (7.65%). The severity index for crashes on the corridor is 5.45. The average severity index for an urban facility is 3.99.

IV. Description of Improvements

The scope of the project is to upgrade the existing 5-lane curb and gutter facility of US 23 / US 441 (Georgia Road) to a 4-lane divided, curb and gutter facility with left overs and U-turn bulbs. The purpose is to improve traffic capacity and mobility, as well as reduce crashes along the US 23 / US 441 corridor. The Division was concerned about the severity of crashes that were occurring near the interchange. Build and no-build alternates were investigated. See Table 1 and 2 for the Level of Service.

Improvements:

- Convert five-lane curb and gutter facility to a four-lane divided, curb and gutter facility.
- Raised median that varies from a 33.5 foot median at the dual U-turn bulb at the southern end of the project and 23 foot median throughout the remainder of the project. A reduced median of 17.5 ft could be considered in later planning and design phases if deemed appropriate.
- Left-overs allowing vehicles to make left turns from the main line to y-lines are proposed at 7 locations.
- There are 13 U-turn bulbs proposed along the project corridor. One of these bulb is a dual U-turn bulb.
- Proposed improvements for the US 64 southern loop off-ramp include widening from two-lanes to four-lanes at the intersection.
- Improvements to Franklin Plaza entrance are to widen from four-lanes to six-lanes at the intersection.
- Y-lines are two-lanes that range from 10 to 12 feet with 2 ft paved shoulders.
- Existing right of way was used on all Y-lines except Franklin Plaza. The proposed right of way width on the entrance to Franklin Plaza is 116 ft. to 138 ft.
- There will be a 5 ft. sidewalk on each side of US 23/441 (Georgia Road) along the project corridor.
- There are four proposed retaining walls along the project corridor. This will minimize right of way impacts.

- There are three existing signals located at the intersections with Franklin Plaza, SR 1660 (Siler Road), and SR 1649 (Prentiss Bridge Road). The proposed improvement will require a traffic signal upgrade the above mentioned intersections and a new signal at the dual U-turn bulb at the southern end of the project corridor.

With this proposed cross-section, it is anticipated in Segment 1, from US 23 / US 441(Georgia Road) from SR 1649 (Prentiss Bridge Road) to SR 1152 (Belden Circle) / SR 1652 (Wide Horizon Boulevard), five (5) residences and five (5) businesses relocated due to this project. The total cost of the Segment 1, including right of way, utility relocation, and construction is estimated to be is \$31,100,000.00. The anticipated relocations in Segment 2, US 23 / US 441 (Georgia Road) from SR 1152 (Belden Circle) / SR 1652 (Wide Horizon Boulevard) to US 64 (Murphy Road-Sylva Road), will be zero (0) residences and five (5) businesses. The total cost of Segment 2, including right of way, utility relocation, and construction is estimated to be is \$14,500,000.00. The total cost of both segments, including right of way, utility relocation, and construction is estimated to be \$44,600,000.

Cost Estimate	Segment 1	Segment 2
Right of Way	\$12,700,000.00	\$6,400,000.00
Utility Relocation	\$1,300,000.00	\$400,000.00
Construction	\$17,100,000.00	\$7,700,000.00
Total	\$31,100,000.00	\$14,500,000.00

V. Community Issues

A detailed community study was not conducted for this feasibility study. The Geographic Information System Service of the North Carolina State Historic Preservation Office used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the project study area. There are no National Register of Historic districts or structures located in the project area.

The following is a list of potential impacts identified within the project corridor.

- Longview Baptist Church
- McGhee Cemetery
- Macon County Recreation Park and Fair Grounds

VI. Natural Environment Issues

The following is a preliminary review of environmental issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database. The purpose of the environmental screening is to identify potential environmental issues early in the process.

Stream Classification

There were three streams identified in the project study area.

- Cartoogechaye Creek – Little Tennessee River Basin
- Setser Branch – Little Tennessee River Basin
- Dowdle Branch – Little Tennessee River Basin

Wetlands

There are no wetlands identified in the project study area.

National Heritage Program - Threatened and Endangered Species

There are no threatened and endangered species identified in the National Heritage Program Database for the project study area.

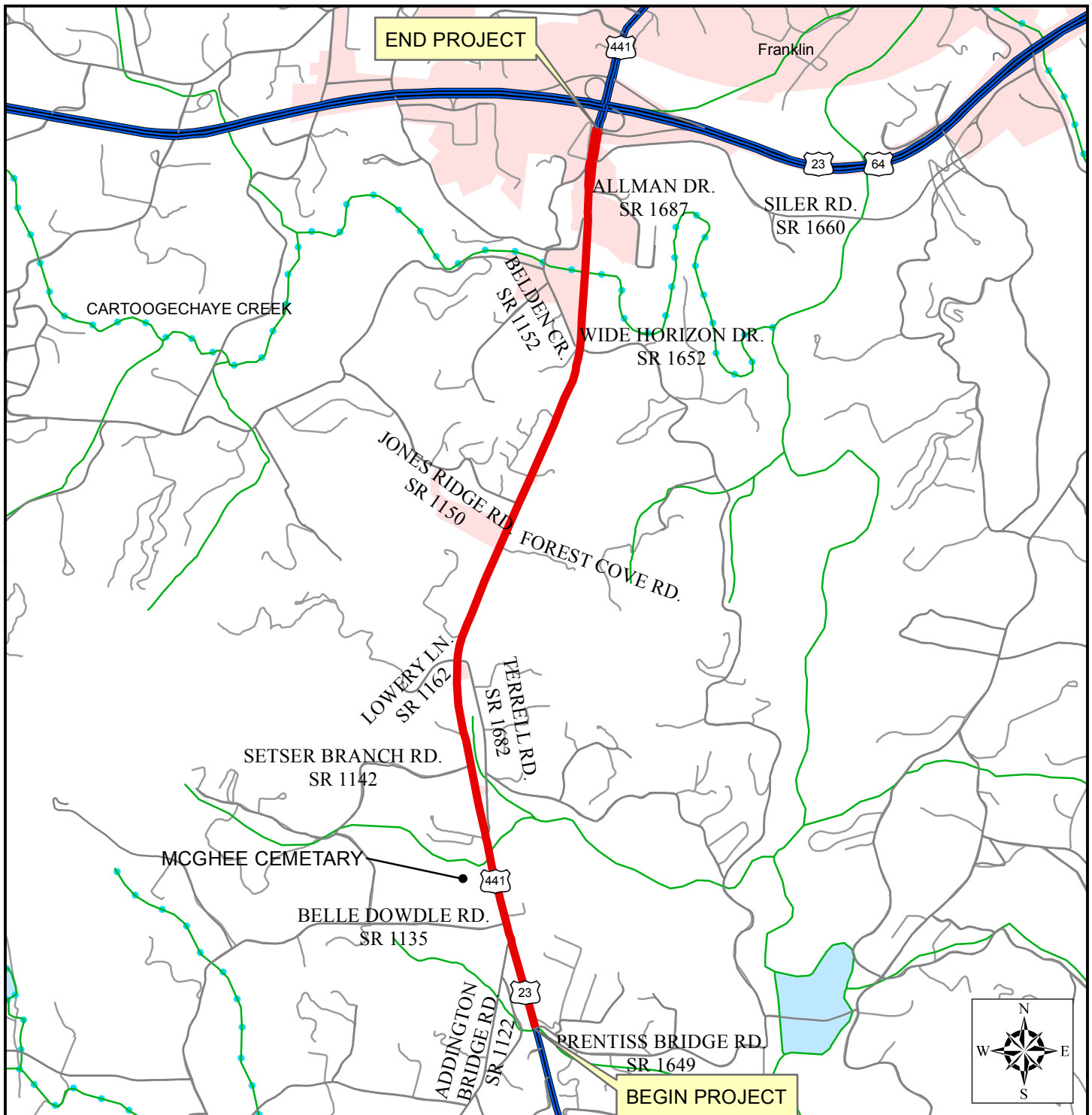
VII. Recommendations

The recommended improvement is to upgrade the existing 5-lane curb and gutter facility of US 23 / 441 (Georgia Road) to a 4-lane divided, curb and gutter facility with left overs and U-turn bulbs.

The proposed change to the existing bridge structure number 25 is the additional widening of 12 ft. in both directions, raised concrete curb and gutter median and 6 ft. sidewalks.

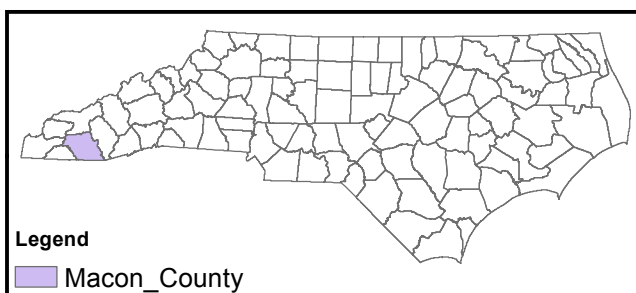
Table 3: Bridge Information

Structure Number	Facility Carried	Feature Intersected	Structure Description	Structure Length	Vertical Clearance	Horizontal Clearance	Year Built	Sufficiency Rating
25	US 23/441 (Georgia Road)	Cartoogechaye Creek	Reinforced Concrete Floor on I-Beams	151'	NA	68'	1956	78.5



0 0.5 1 Miles

FS-1214A Project Limits



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH
FEASIBILITY STUDIES UNIT

Project Location Map: FS-1214A Figure 1

US 23/441
From SR 1649 (Prentiss Bridge Road) to US 64.
Upgrade roadway with access management features.

Macon County Division 14